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XXIX. *An Account of an Occultation of the Star ζ Tauri by the Moon, observed at* Leicester : *By the Rev. Mr.* Ludlam, *in a Letter to the Rev. Mr.* Maſkelyne, *Aſtronomer Royal.*

Reverend SIR,

Read June 4, 1770.

I Here ſend you an account of the occultation of the ſtar ζ Tauri by the moon, as we ſaw it at Leiceſter April 28, 1770. The neceſſary obſervations for examining the clock, are ſubjoined, which I think ſhould always be done by thoſe who have not fixed obſervatories ; or where their inſtruments are not well adjuſted at firſt, and frequently examined afterwards. Without being thus particular, no one can judge what degree of credit may be afforded to ſuch obſervations; and it has, beſides, this advantage, that if a miſtake ſhould be made in the calculations grounded on them, any perſon verſed in Aſtronomy can rectify it.

I beg the favour of you to communicate this to the Royal Society ; and am,

With the greateſt reſpect,

Their and your moſt humble ſervant,

Leiceſter, April 29, 1770.

W. Ludlam.

The

The immerſion was noted at $ix^h$ $41^m$ $7^s$ by the clock. I think it might be two ſeconds ſooner, be-cauſe the clock being of neceſſity at a diſtance from the teleſcope, the inſtant of the immerſion was ſigni-fied by ſtriking upon a bell. The emerſion was about $x^h$ $31'$ but with ſome uncertainty, the ſtar be-ing hid by a cloud at its firſt coming out.

By the obſerved tranſits of the ſun and ſtars, the clock loſt three ſeconds between the $25^{th}$ and $28^{th}$. On the $25^{th}$, by correſponding altitudes, the clock was $1'$ $46''$, 8 too ſlow; whence on the $28^{th}$ it was $1'$ $49''$, 8 too ſlow. This confirms the obſervation made by correſponding altitudes on the $28^{th}$, by which it was $1'$ $50''$ too ſlow at noon: the clock was then loſing at the rate of four ſeconds a day; whence, on the $28^{th}$ at $ix^h$, it was $1'$ $51''$, 5 ſlower than mean time. The equation of time on the $28^{th}$ at $ix^h$ was $2'$ $47''$, 5, whence the immerſion was at $ix^h$ $45'$ $44''$ apparent time.

The Teleſcope made uſe of was one of Dollonds, with a triple object glaſs of $33\frac{1}{3}$ inches focal diſtance, and which magnifies 52 times.

| Day of the month 1770 | Transits. Time by the clock. Passage over | | | Object |
|---|---|---|---|---|
| | First wire | Meridian | Third wire | |
| | M S | H M S | M S | |
| April 24 | 53 54 | XXIII 54 42 | 55 27½ | } Sun |
| | 56 6 | 56 53½ | 57 58 | |
| 26 | 7 36 | X 8 21 | 9 5½ | γ Virginis |
| 27 | 11 8 | IX 11 55 | 12 41 | β Leonis |
| | 3 39 | X 4 25 | 5 9½ | γ Virginis |
| | 17 28 | 18 24 | 19 9 | δ Virginis |
| | 46 35 | 47 21 | 48 6½ | Spica V |
| | 53 24 | XXIII 54 11 | 54 56¾ | } Sun |
| | 55 35 | 56 22 | 57 8 | |
| 28 | 7 9 | IX 7 56 | 8 43 | β Leonis |
| | 59 41 | X 0 26½ | 1 11 | γ Virginis |
| | 13 30 | 14 25½ | 15 10 | δ Virginis |
| | 42 36½ | 43 23 | 44 8 | Spica V |
| | 53 10 | XXIII 53 57½ | 54 44 | } Sun |
| | 55 21½ | 56 9 | 56 55 | |
| 29 | 3 10½ | IX 3 58 | 4 44 | β Leonis |
| | 53 0 | XXIII 53 47 | 54 33½ | } Sun |
| | 55 13 | 56 0 | 56 46 | |

Corresponding altitudes taken with an Hadley's quadrant of seven inches radius, by reflection from water.

| Sun | | | April 25, 1770 |
|---|---|---|---|
| Double Alt. 65° | | Index err. + 1ᵐ | |

| | Time by the clock. | | |
|---|---|---|---|
| | Eastern Az. | Western Az. | Meridian |
| Up. limb | VIII 21 48½ | III 30 43 | XI 56 15¾ |
| Center | 23 42 | 28 52 | 17 |
| Low. limb | 25 37 | 26 54½ | 15¾ |
| Second set. Doub. Alt. 67° 30' | | | |
| Up. limb | VIII 30 45 | III 21 45 | 15 |
| Center | 32 40 | 19 49 | 14½ |
| Low. limb | 34 35½ | 17 53 | 14¼ |
| Third set. Doub. Alt. 70° | | | |
| Up. limb | VIII 39 53 | III 12 34½ | 13¾ |
| Center | 41 50 | 10 41 | 15½ |
| Low. limb | 43 48 | | |

| | | Meridian |
|---|---|---|
| Mean of all three sets | XI | 56 15,2 |
| Cor. for ½ interval 3ʰ 20' | — | 16,3 |
| Passage over true meridian | XI | 55 58,9 |
| Clock too slow | | 1 46,8 |

| Sun | | | April 28, 1770 |
|---|---|---|---|
| Double Alt. 79° 11' | | Index err. + 1ᵐ | |

| | Time by the clock. | | |
|---|---|---|---|
| | Eastern Az. | Western Az. | Meridian |
| Up. limb | IX 8 12½ | II 43 6½ | XI 55 39½ |
| Center | 10 16 | 41 3 | 39½ |
| Low. limb | 12 22½ | 38 56 | 38¾ |

| | | Meridian |
|---|---|---|
| Mean | XI | 55 39,5 |
| Cor. for ½ interval 2ʰ 20' | — | 13,5 |
| Passage over true meridian | XI | 55 26 |
| Clock too slow | | 1 ·50 |

XXX. *Extract*